

Executive Order 266

Uniform Floodplain Management Policy Stakeholder Input Webinar

July 26, 2023



Today's Agenda

1. **Welcome and Meeting Purpose** – *Bailey Recktenwald (NC Governor's Office)*
2. **Introduction to EO 266** – *Michael Ali (NC Department of Administration)*
3. **Topic 1: Updating Topics Within the Existing Uniform Floodplain Management Policy** – *Raffaele Esposito (NC Department of Administration)*
4. **Topic 2: Implementing Sea Level Rise and Coast Zones** – *Eryn Futral (NC Division of Emergency Management)*
5. **Topic 3: Zone X** – *Brian Radakovic (NC Department of Transportation)*
6. **Topic 4: State Funded Projects** – *Michael Ali (NC Department of Administration)*
7. **Topic 5: Nature-based Infrastructure to Reduce Flood Risk** – *Marlena Byrne (NC Office of Recovery and Resilience)*
8. **Time for additional questions** – *Bailey Recktenwald (NC Governor's Office)*
9. **Wrap-up**– *Bailey Recktenwald (NC Governor's Office)*

Welcome and Meeting Purpose

- EO 266 directs the NC Department of Administration to develop a new Uniform Flood Management Policy for future ***state-owned construction***
- This new policy will position the State of North Carolina to lead by example
- Over the past year, a committee of interagency experts have been developing recommendations for DOA to consider in the Policy update
- The purpose of this webinar is for the committee to present recommendations to DOA and to stakeholders both internal and external to state government
- These recommendations are NOT final. We want to hear from you today!

Housekeeping

- Please be sure to stay on mute when not speaking
- We will be monitoring questions in the chat and will have 5 minutes after each presentation for specific questions and time for further questions at the end
- This meeting will be recorded and slides will be available online
- DOA will publish the draft of the new policy by September 29, 2023
- There will be a 60 day public comment period from September 29-November 29, 2023
- Materials and draft for comment will be available at <https://ncadmin.nc.gov/about-doa/sustainability>

Presenters

Michael Ali, PE
Assistant Director CM+FCAP
State Construction

Raffaele Esposito, PE
Civil / Structural Engineering Supervisor
State Construction

Eryn Futral, AICP, CFM, CZO
NFIP Planner, Eastern Branch
DPS – Emergency Management

Brian Radakovic, PE, CFM
Highway Floodplain Program Engineering Supervisor
NC Department of Transportation

Marlena Byrne
Deputy Chief Resilience Officer
NC Office of Recovery and Resiliency





**Historic North
Carolina Flood Events:
The Deluge of 1940**



**Historic North
Carolina Flood Events:
Hurricane Hazel 1954**



**Historic North
Carolina Flood Events:**

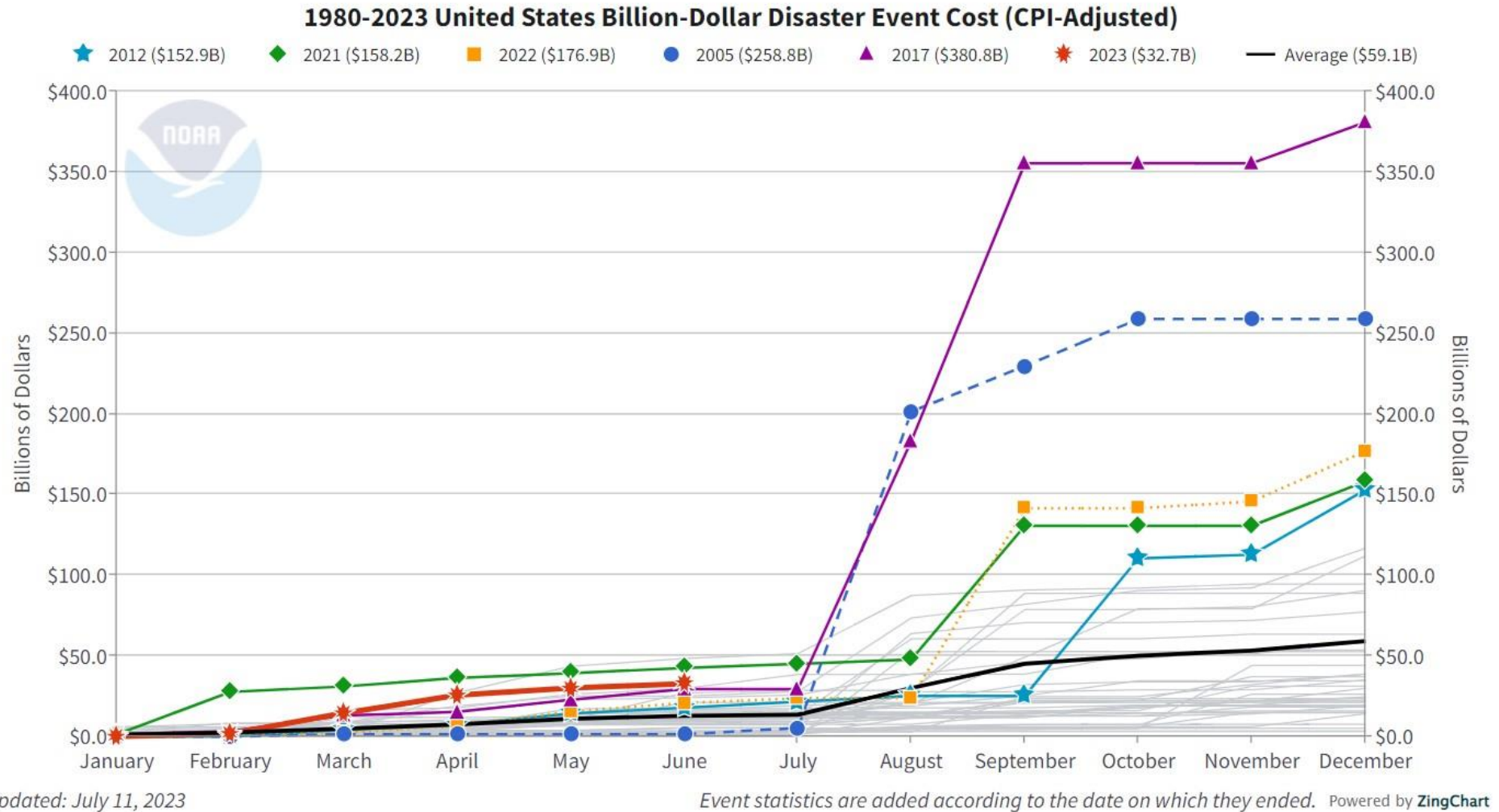
**Hurricane Matthew
2016**



**Historic North
Carolina Flood Events:**

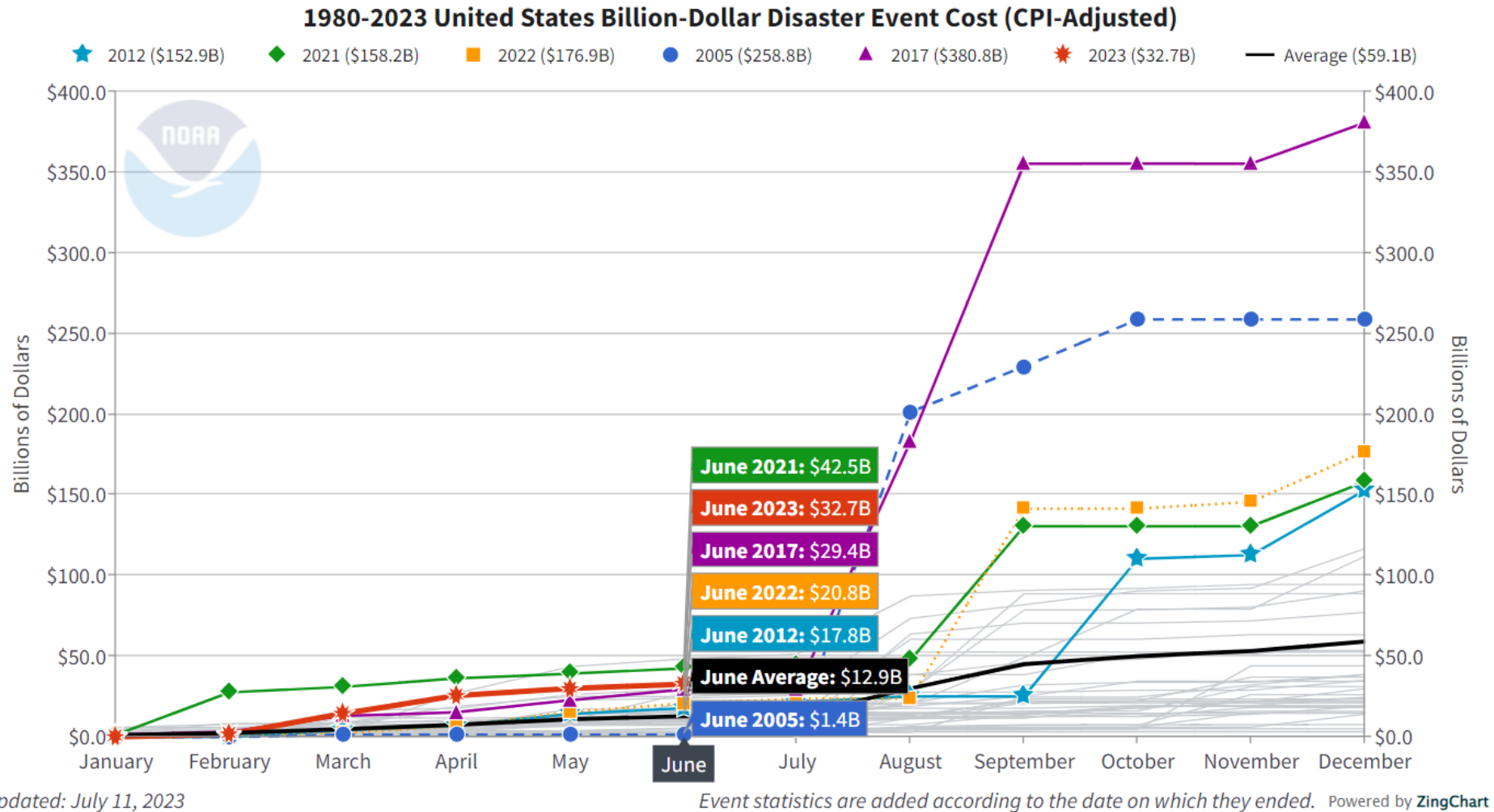
**Hurricane Florence
2018**

Billion-Dollar Disasters on the Rise



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Billion-Dollar Disasters on the Rise



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EO266 Creation

EO80 – NC's Commitment to Address Climate Change

NC Climate Risk Assessment and Resiliency Plan

NC Climate Change Interagency Council

Agencies to incorporate climate adaptation and resiliency into their policies

NC Climate Risk Assessment and Resiliency Plan

- Analyzed historical data and projected climate trends
- Identified areas of vulnerability of State infrastructure, assets and programs
- Provides a framework to guide future state action.
- Establish an Interagency Resilience Team.



EO123

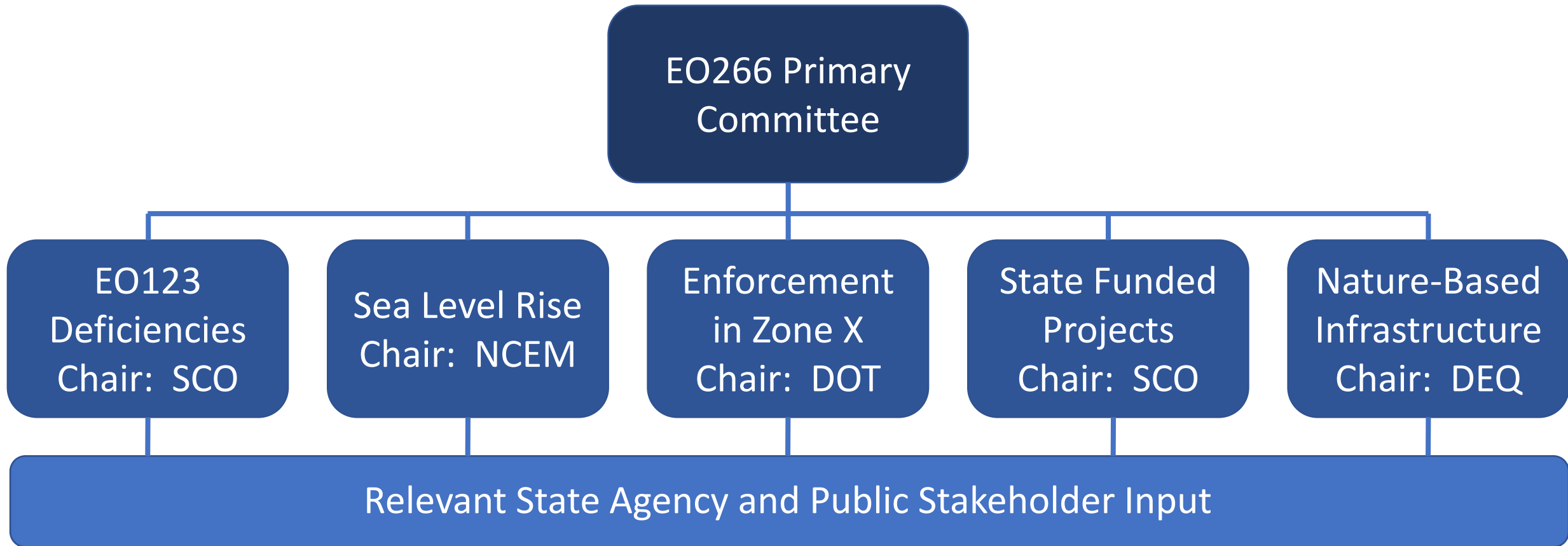
What's Wrong with EO123?

- Outdated. Last updated in 1990.
- Freeboard requirements not in accordance with current recommendations.
- Does not discourage or prevent new development in the floodplain.
- Sea Level Rise is not addressed.

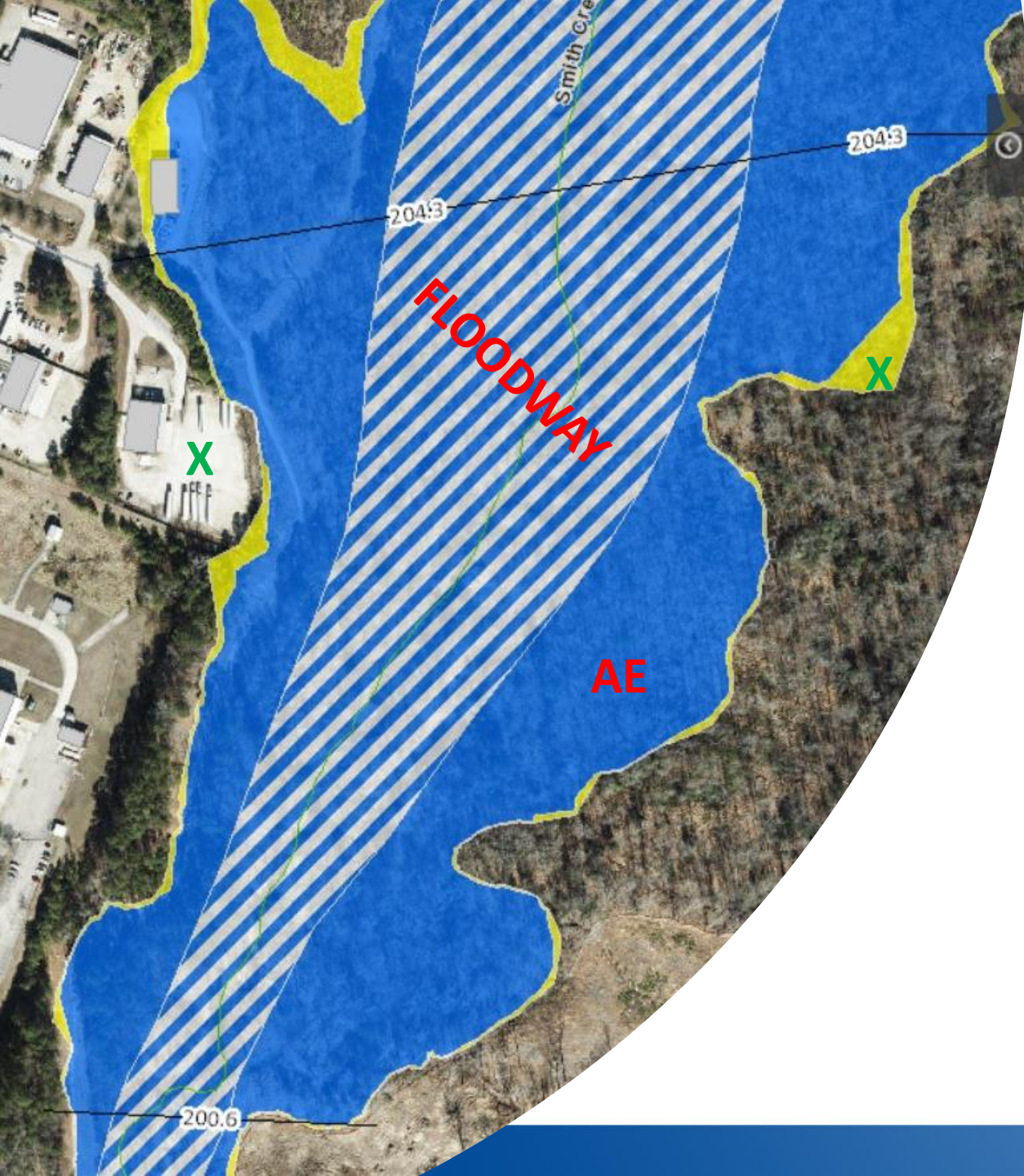
What does EO266 ask us to do?

- NCDOA, in consultation w/ NCDEQ, NCDOT, NCEM & NCORR shall update EO123 as follows:
 - Reduce construction in the floodplain to the greatest extent feasible.
 - Minimize flood damage to state-owned assets.
 - Consider the impacts of sea level rise and climate change.
 - Support natural hydrologic conditions and the beneficial services provided by natural infrastructure.
 - Expand policy to state-funded construction to the extent feasible and permitted by law.

Tackling the Problem...



Terms and Definitions:



- Zone X (unshaded) – Area of minimal flood hazard, usually above the 500-year flood elevation. Currently **unregulated**.
- Zone X (shaded) – Area of moderate flood hazard, usually btwn limits of 100-year and 500-year flood. Currently **unregulated**.
- Zone AE – Has a 1% annual chance of flooding and coincides with the 100-year floodplain. **Regulated**.
- Floodway – **Highly Regulated**.

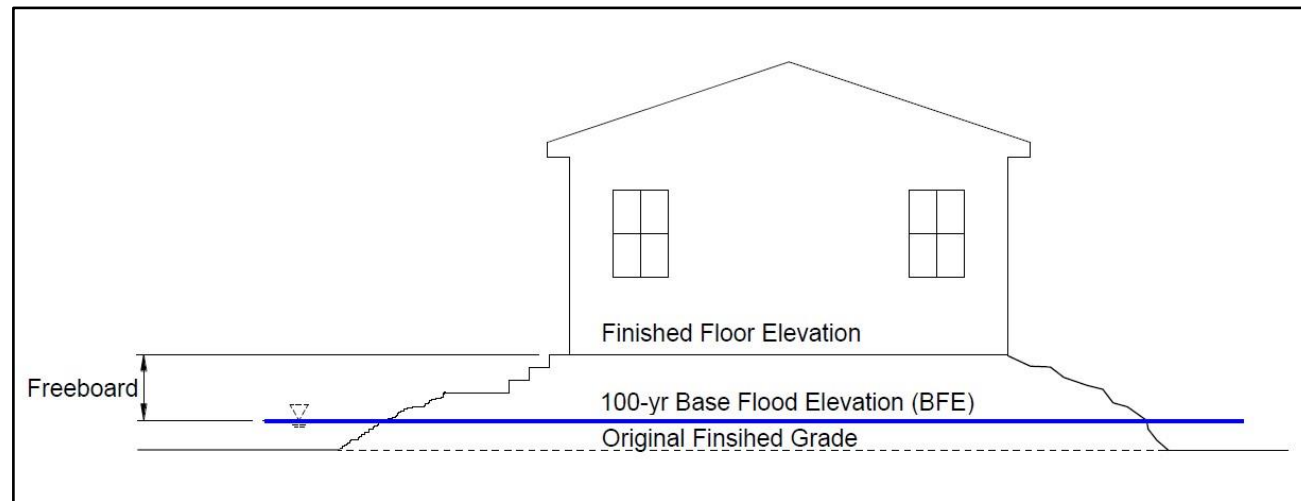
More Terms and Definitions

- Development – Any man-made change to improved or unimproved real estate, including, but not limited to, buildings and structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.



More Terms and Definitions

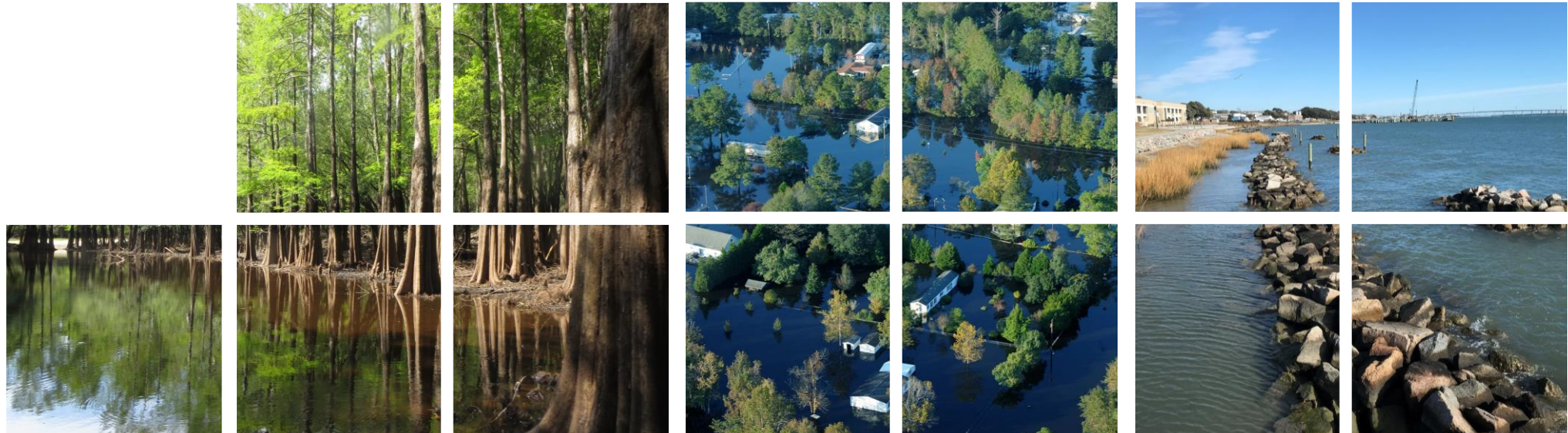
- Base Flood Elevation – The elevation of surface water resulting from a flood that has a 1% chance of occurring in any given year.
- Freeboard - An additional amount of height above the Base Flood Elevation used as a factor of safety. This is established by state or community floodplain management regulations.



Updating EO123 Provisions

Goal – Improve existing guidelines to align with EO266 expectations.

Topics - Reduce construction in the floodplain, consider current standards and the NCEM model ordinance, incorporate NEAs, and establish a time window for tracking substantial improvement.



Existing Policy – EO123

EO123 – Uniform Floodplain Management Policy for State Construction

Uniform Floodplain Management Policy for State Agencies and University System.

Administered by DOA - State Construction Office

Applicable to development on State-owned land and private property leased to the State

Excludes DOT Highway Construction Projects

Excludes Community Colleges (County Owned Land)

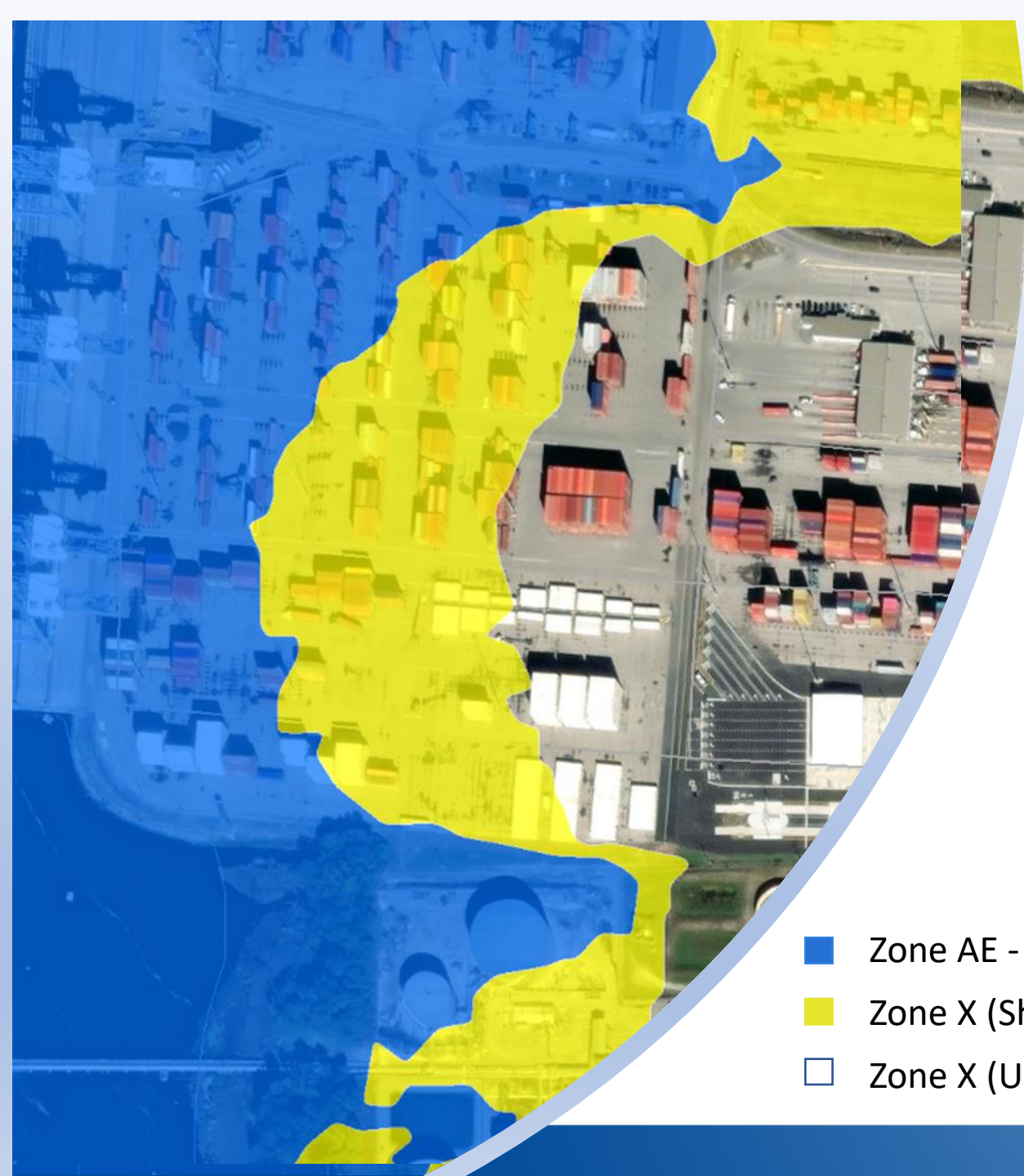
EO266 - Objectives

EO266 – Updating the NC Uniform Floodplain Management Policy for State Construction

- Reduce construction in the floodplain to the greatest extent feasible.
- Implement measures to minimize flood damage to state-owned assets.
- Consider the impacts of sea level rise and climate change.
- Support natural hydrologic conditions and the beneficial services provided by natural infrastructure.
- Expand policy to state-funded construction to the extent feasible and permitted by law.

Siting Guidelines

- Minimize construction activities within floodplains to the maximum extent feasible
- “No new state-owned buildings, or buildings constructed on state-owned property, shall be constructed, or substantially improved within a Special Flood Hazard Area or Zone X (shaded) designated under the National Flood Insurance Program (100-year and 500-year floodplains) unless a waiver is granted.”

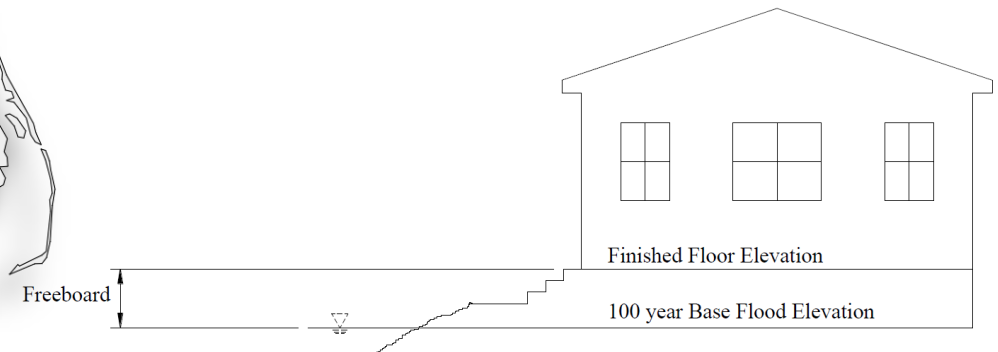
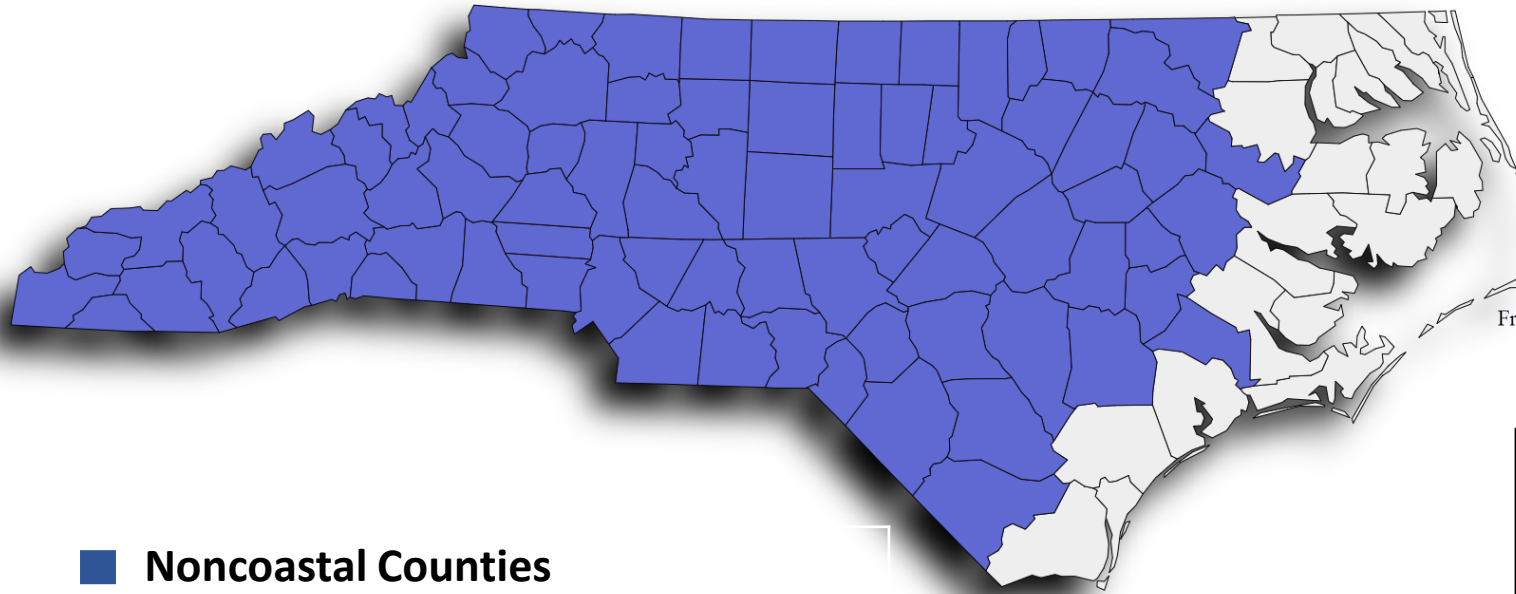
- 
- Zone AE - 100-year Floodplain
- Zone X (Shaded) - 500-year Floodplain
- Zone X (Unshaded)

Waiver Process

A waiver to the siting guidelines may be granted based on a combination of factor including but not limited to the following conditions:

- **Water-dependent uses.** Projects that require continued direct access to the water as an integral part of the use, or facilities that directly support water dependent uses.
- **Passive public access.** Projects that provide either recreational or scenic access to water bodies or shoreline areas which need to be within a flood zone for their purpose, including those that provide a flood mitigation benefit.
- **Critical Facilities.** Buildings or structures are demonstrated to be necessary to protect public health, safety, and welfare.
- **Historic structures.** The necessity of continued investment of State resources in properties individually listed or determined eligible for listing in the National Register of Historic Places
- **Physical Site Constraints.** Owners/Agencies must demonstrate the absence of suitable alternative siting locations with a lower risk of flooding. Acceptable reasons include: project sites entirely located within SFHAs or Shaded Zone X, sites partially within SFHAs or Shaded Zone X that lack developable areas outside the regulated zones, or sites where topographic conditions hinder compliance.

Design Guidelines - Freeboard Requirements



Noncoastal Freeboard Building Elevation Requirements:

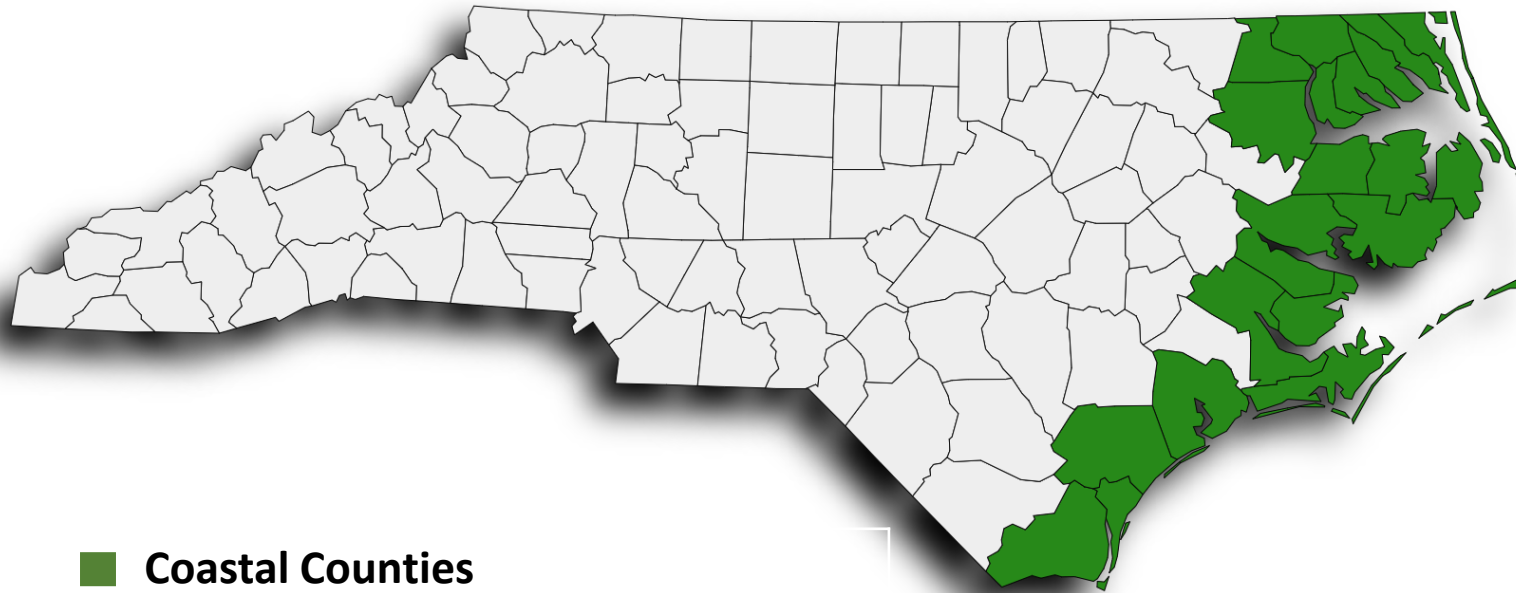
Minimum Elevation of the Top of the Lowest Floor = BFE + Freeboard

Where:

BFE = FEMA 100-year BFE

Freeboard = 2 feet for all projects.

Design Guidelines – Freeboard Requirements



An additional two (2) feet of freeboard is recommended for Coastal Counties to account for the following:

- Increased vulnerability of low-lying areas that are exposed to both coastal and riverine flooding
- Future inundation and flooding
- Storm surge over the anticipated design life of a project

Coastal Freeboard Building Elevation Requirements:

Minimum Elevation of the Top of the Lowest Floor = BFE + Freeboard

Where:

BFE = FEMA 100-year BFE

Freeboard = 4 feet for all projects.

Note: For Coastal High Hazard and Coastal Zone A above requirements apply to the Bottom of the Lowest Supporting Horizontal Structural Member.

Substantial Improvement – Cumulative Improvement

Substantial Improvement —Any reconstruction, rehabilitation, addition, or other improvement to a structure , the cost of which equals or exceeds 50% of its pre-improvement market value.

- Recommendation is to track cumulative substantial improvement over a six (6) year period, which aligns with three biannual state budget cycles.
- Ensuring that the State is not overinvesting in buildings that are non-compliant and located in flood-prone areas.
- Tracking repetitive flood damages and phased improvement.

Substantial Improvement – Tracking over time

Example of SI over time:

Elapsed time from initial permit application	Current market value (at the time of each permit application)	Cost of improvement	Cost as percentage of current market value	Cumulative percentage
0 year	\$100,000	\$10,000	10%	10%
3 years	\$110,000	\$42,000	38%	48%
6 years	\$120,000	\$10,000	8%	56%

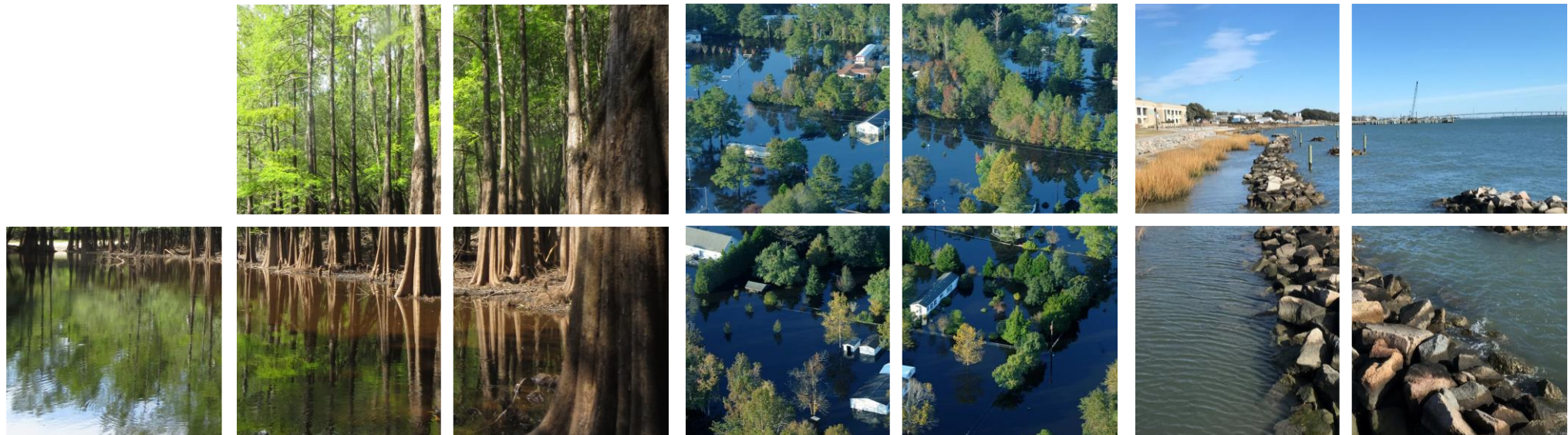
Questions?



Coastal Zones and Sea Level Rise

Goal - Incorporate Sea Level Rise into floodplain management policy.

Topics — Rise extent, Impacts on coastal A and V zones, Data sources, and NCFRIS integration



Sea Level Rise Considerations

NOAA - North Carolina is vulnerable to Sea Level Rise (SLR)

State Agencies must prioritize Relative Sea Level Rise in planning and designing coastal buildings and infrastructure.

Coastal High Hazard Areas (V Zones) and Coastal AE Zones (CAZ)

- Align the policy with the NC NFIP Coastal Model Ordinance.
- Include Coastal AE Zones in Coastal High Hazard Area/VE Zone development standards.
- Insert relevant definitions:
 - Coastal AE
 - Limit of Moderate Wave Action (LiMWA)
- Revise existing definitions as necessary:
 - “Coastal High Hazard Area” by clarifying this refers to VE zones
 - “Reference Level” by adding Coastal AE zones to the zones that use the lowest horizontal structural member as the reference.

Definitions

Global Mean Sea Level (GMSL): average height of the entire ocean surface

Relative Sea Level (RSL): Sea surface elevation relative to a local datum

Regional Relative Sea Level (RRSL): Projected regional sea level for the southeast in 2100 by NOAA

Definitions

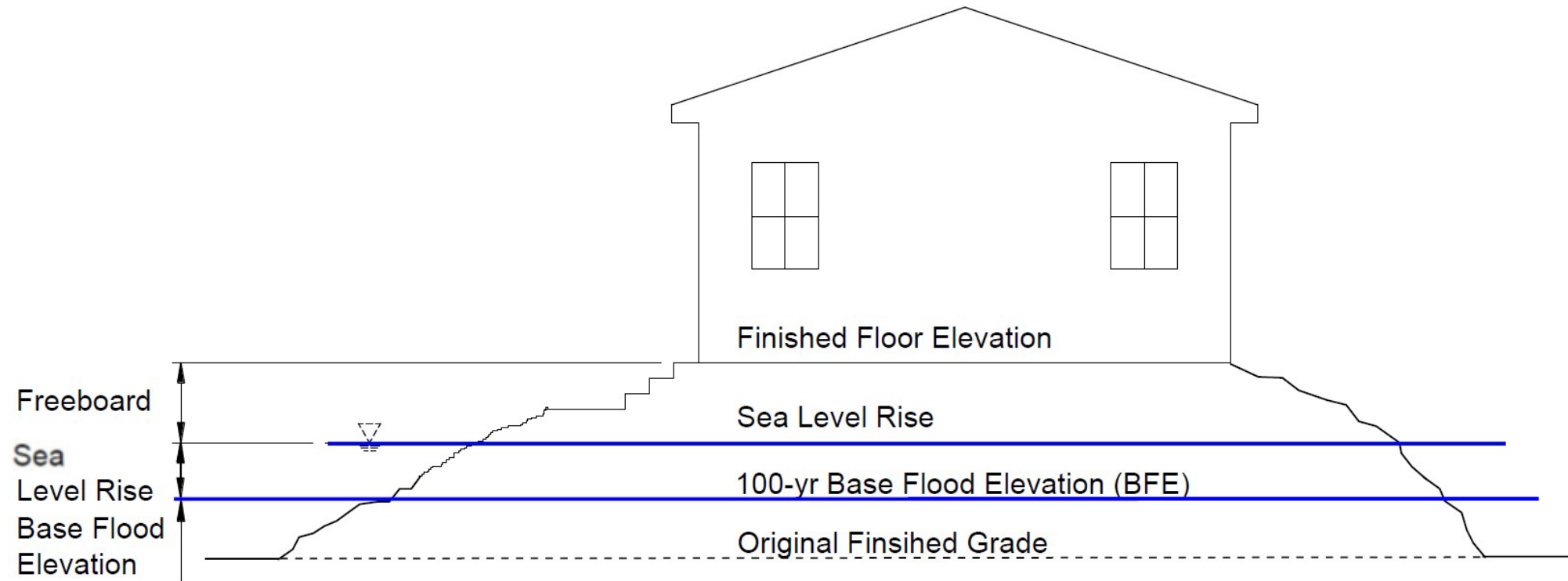
Maximum Sea Level Rise Elevation: Highest BFE along NC Coast from NC FRIS, plus "Freeboard" and "Regional Relative Sea Level"

Minimum Sea Level Rise Elevation: Lowest BFE along NC Coast from NC FRIS and FIRMs, plus "Freeboard" and "Regional Relative Sea Level"

Sea Level Rise Setback: Landward extent of projected regional sea level in 2100 by NOAA, depicted on NC FRIS maps

Sea Level Rise Elevation Standard (SLRES): "Regulatory Flood Protection Elevation" plus "Regional Relative Sea Level." Includes specific elevations for different flood hazard areas.

Sea Level Rise Elevation Standard



Considerations Options 1, 2 & 3

3 Regional Sea Level Rise Scenarios for the Southeast U.S. by the year 2100

- **Option 1 (High Scenario):** Predicts a regional relative SLR of 2.1 meters (6.9 feet)
 - Applicable to all development waterward of the projected regional sea level
 - Sea Level Rise Setback: Recommend an additional 0.25 miles from the landward extent of the projected regional sea level
 - Recommend an additional 7-foot elevation above the Regulatory Flood Protection Elevation (RFPE), also known as the Sea Level Rise Elevation Standard (SLRES)
- **Option 2 (Intermediate-High Scenario):** Predicts a relative SLR of 1.6 meters (5.2 feet)
 - Applicable to all development waterward of the Sea Level Rise Setback
 - Recommend an additional 5-foot elevation above the RFPE (SLRES)
- **Option 3 (Intermediate Scenario):** Predicts a relative SLR of 1.1 meters (3.6 feet)
 - Applicable to all development waterward of the Sea Level Rise Setback
 - Recommend an additional 4-foot elevation above the RFPE (SLRES)

Reference

National Oceanic and Atmospheric Administration (NOAA) Global and Regional Sea Level Rise Scenarios for the United States Report, Feb. 2022

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Considerations Option 4

- **G.S. 113A-107.1 Sea-level policy**
 - (e) The Commission shall be the only State agency authorized to define rates of sea-level change for regulatory purposes. If the Commission defines rates of sea-level change for regulatory purposes, it shall do so in conjunction with the Division of Coastal Management of the Department. The Commission and Division may collaborate with other State agencies, boards, and commissions; other public entities; and other institutions when defining rates of sea-level change. (2012-202, s. 2(a).)
- **Sea Level Rise Scenario Based on the *North Carolina Sea Level Rise Assessment Report***
 - Option 4 (High Scenario)**: predicts a maximum relative SLR of 10.6 inches by 2045
 - Applicable to all development waterward of the Sea Level Rise Setback.
 - Recommend an additional 1-foot elevation above the RFPE defined as the Sea Level Rise Elevation Standard (SLRES).

Reference

North Carolina Sea Level Rise Assessment Report (2015 Update to the 2010 Report and 2012 Addendum), March 31, 2015
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Sea Level Rise Considerations

Common development regulations among all 4 options

- Require a higher standard for the siting, design, and access for structures/facilities identified as High risk to the public or disruption to the community pursuant to American Society of Civil Engineers (ASCE)/Structural Engineering Institute (SEI) 24-14 *Flood Resistant Design and Construction*, 2015.
 - Recommend an additional 2-foot elevation
- Substantial Improvement/Damage (SI/SD) - subject to development standards for new construction.
- Non-SI/SD shall be designed and constructed to minimize flood damage:
 - Elevate or floodproof electrical and mechanical as much as practicable.
 - Install flood venting in below Sea Level Rise Elevation Standard (SLRES) enclosures.
 - Abandon the use of below SLRES enclosures for any other purpose other than building access, storage, or parking of vehicles.
 - Design and construction of public accessways to or above the SLRES or elevated/protected as much as practicable.
 - Floodproof structures when applicable and in accordance with FEMA Technical Bulletin 3, *Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings*.
- Consider and plan for the relocation of existing structures, sites, facilities, accessways impacted by sea level rise.
 - Provide a specific timeframe for completion of site/building evaluations for all state structures waterward of the sea level rise setback (options 2, 3, & 4) or the regional sea level (option 1).
- Additional siting and design considerations:
 - Siting landward of the Sea Level Rise Setback
 - Siting on high ground
 - Minimize siting in areas subject to other hazards
 - Multi-hazard design and construction
 - Shoreline protection Methods

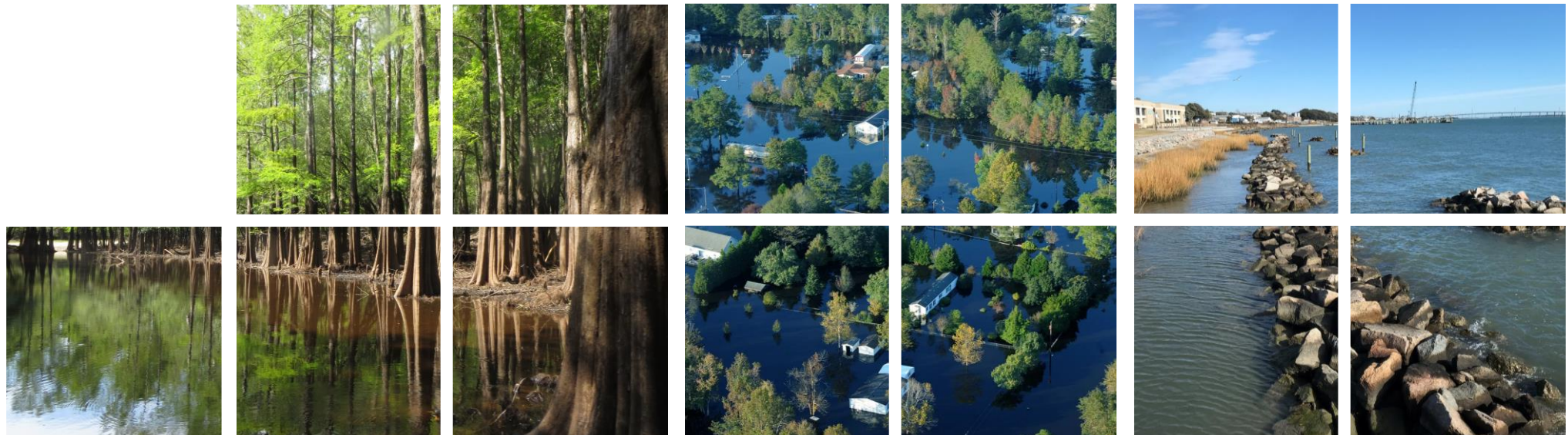
Questions?



Enforcement within Zone X

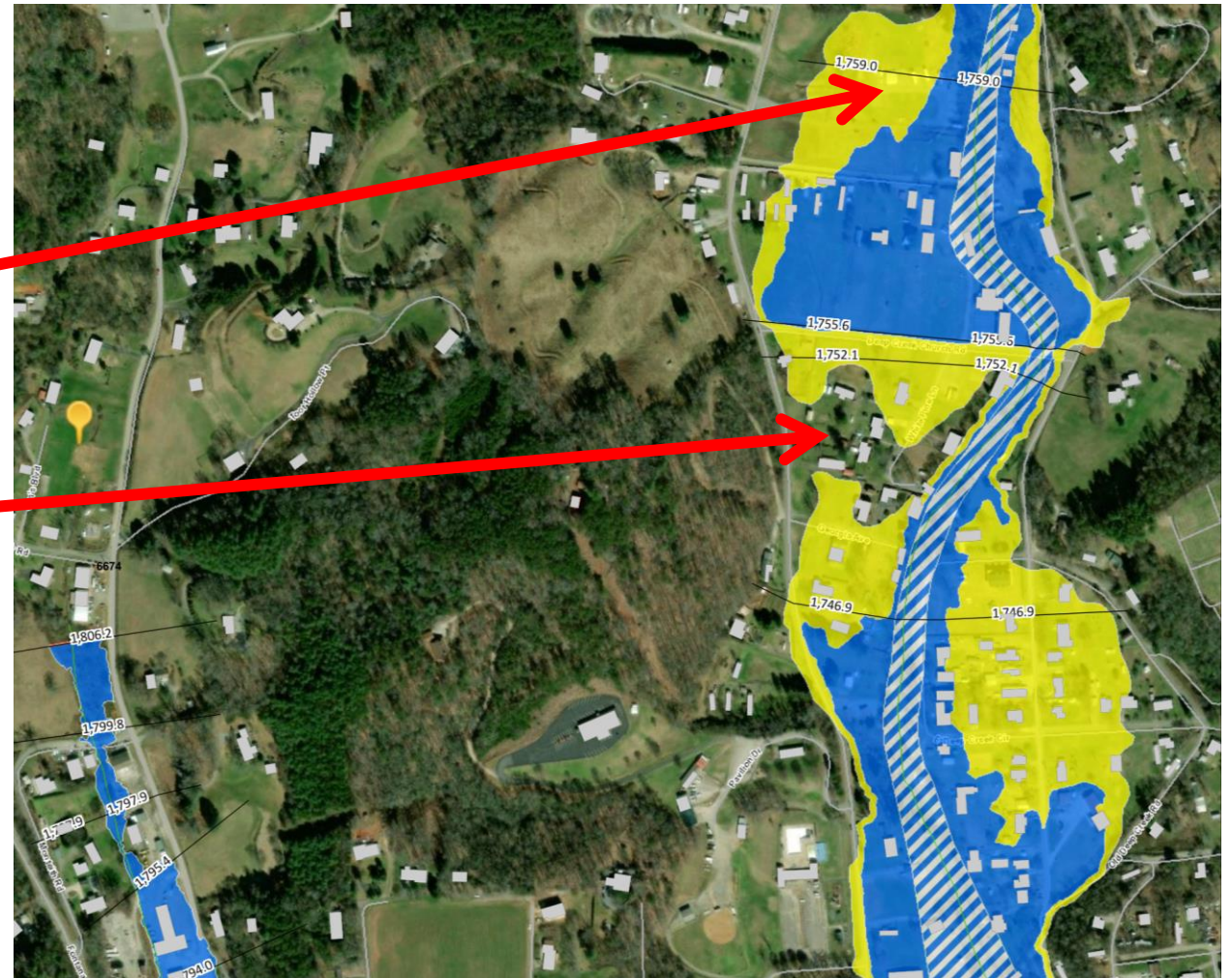
Goal — Expand the policy to include Zone X

Topics — Shaded Zone X, unshaded Zone X, enforcement and enforcement triggers



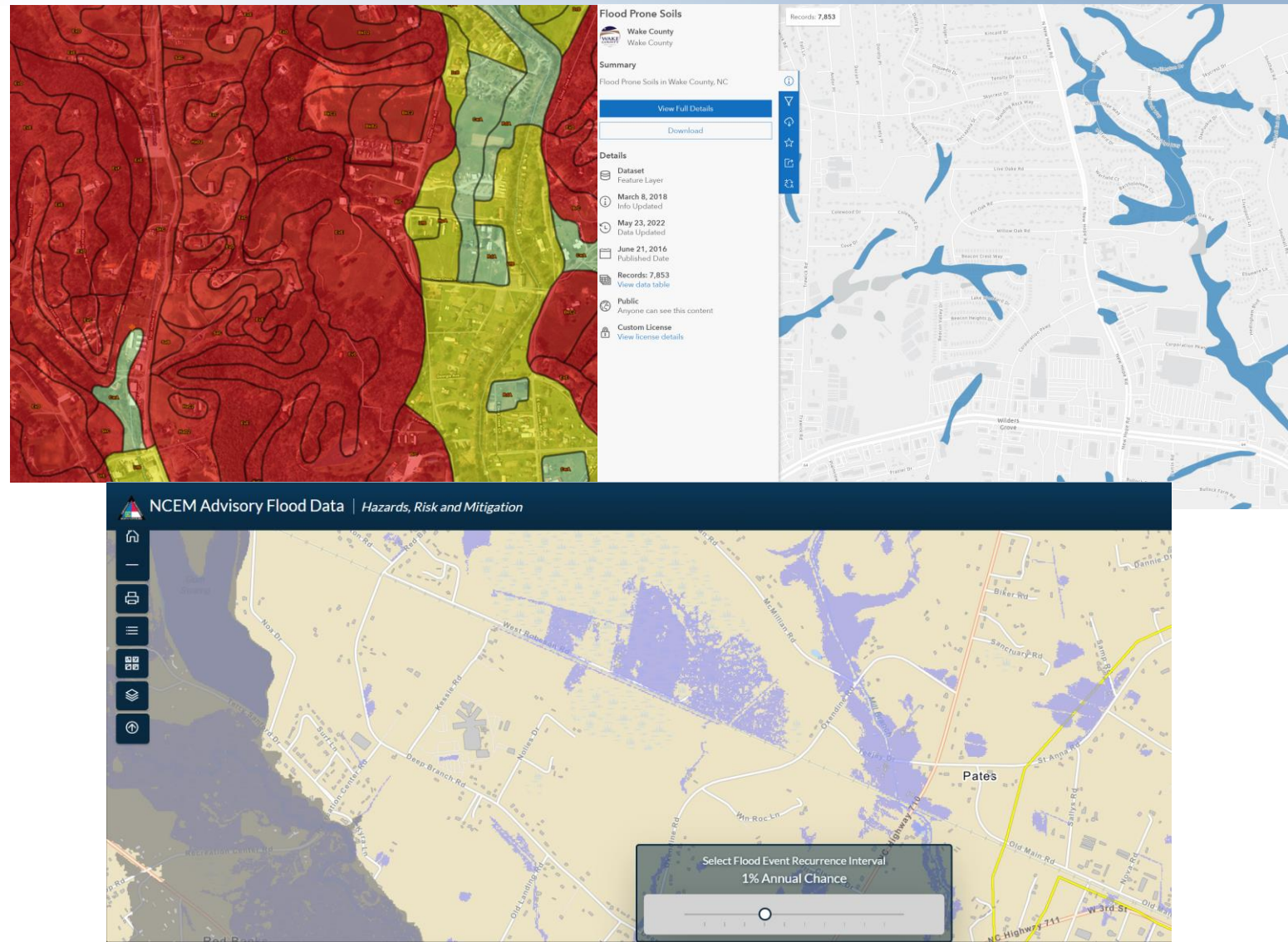
Identifying Flood Risk areas in Zone X (Shaded/Unshaded)

- Areas outside the one percent chance flood zone, but within the 0.2 percent chance flood zone, as determined by a detailed study
- Areas outside the 0.2 percent chance flood zone as determined by a detailed study
- Areas that have not yet been studied but there is evidence that a potential flood hazard exists.



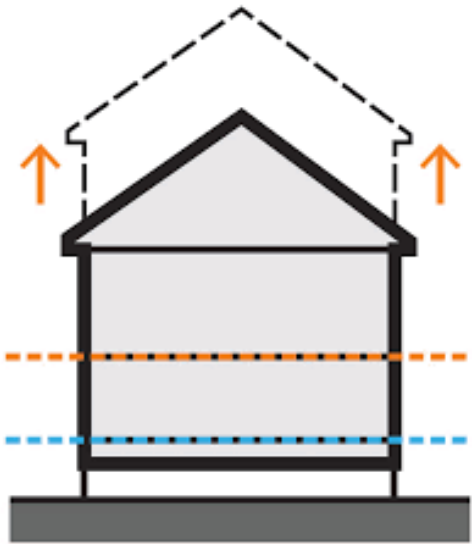
Identifying Flood Risk areas in Zone X (Shaded/Unshaded)

- Evidence of flood hazards can include:
 - USDA NRCS Web Soil Survey map showing a Flood Frequency Class of Occasional or greater
(<https://websoilsurvey.sc.egov.usda.gov/app/>)
 - Identified on a Community Flood Prone Soils Map
 - Flooding shown on NCFMP's Advisory Flood Map
(<https://flood.nc.gov/AdvisoryFlood/Home>)
 - Areas of repetitive loss due to flooding as identified by the local community



Provisions to follow in Zone X (Shaded/Unshaded)

All new construction and substantial improvements within a Flood Risk area Identifies in Zone X (Shaded/Unshaded) the lowest floor, including the basement shall be elevated to an elevation as described below:



- Within the 0.2 percent annual chance flood hazard area, shall be elevated to the 0.2 annual chance water surface elevation or two (2) feet above the adjacent base flood elevation (BFE) whichever is greater.
- In areas prone to flooding but outside the 0.2 percent annual chance flood hazard area, shall be elevated to the 0.2 annual chance water surface elevation or two (2) feet above the highest adjacent grade whichever is greater.
- Areas that have not yet been studied but there is evidence that a potential flood hazard exists from soil maps or repetitive flooding areas, shall be elevated at least two (2) feet above the highest adjacent grade.
- Within Advisory Flood Hazard Areas, shall be elevated to two (2) feet above the one percent annual chance water surface elevation or to the 0.2 annual chance water surface elevation whichever is greater.

Recommendations

- The following terms be included in the definitions
 - Advisory Flood Map, Zone X (Shaded), Zone X (Unshaded)
- Include a Standard for Areas outside of the SFHA's
 - Provide how the areas are determined:
 - Within the 0.2 percent chance flood zone
 - Outside the 0.2 percent chance flood zone
 - No Study, but evidence a potential flood hazard exists from:
 - USDA NRCS Web Soil Survey map,
 - A Community Flood Prone Soils Map
 - NCFMP's Advisory Flood Map
 - Areas of repetitive loss due to flooding as identified by the local community
 - Provide the provisions to follow for each area
 - "Base Flood Elevation" plus "Freeboard"

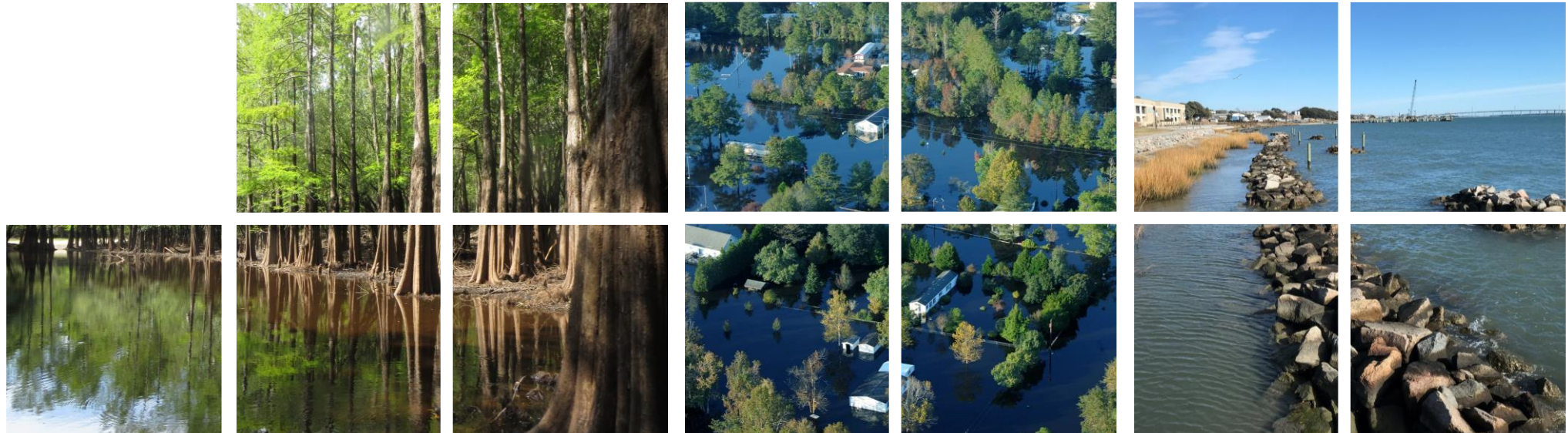
Questions?



Policy Expansion to State Funded Projects

Goal — Expand NC's Floodplain Management to Include all State Funded Projects.

Topics — Legality, Enforcement During Design and Construction



Expanding to State Funded Projects:

The Primary Committee shall analyze the effect of expanding the requirements of the Policy beyond state-owned construction to also include state-funded construction. This analysis shall evaluate the legal, financial, environmental, and regulatory implications of such an expansion. The analysis also shall address the financial impact to the state of not applying the Policy to state-funded construction, including losses reasonably anticipated due to flooding. NCDOA shall publish the analysis within eighteen (18) months of this Executive Order. Additionally, NCDOA shall include provisions in the updated Policy that expand the Policy to state-funded construction to the extent feasible and permitted by law.

What is Permitted by Law?

- **§ 143-215.54. Regulation of flood hazard areas; prohibited uses.**
 - A local government may adopt ordinances to regulate uses in flood hazard areas and grant permits for the use of flood hazard areas
- **§ 143-215.54A. Minimum standards for ordinances; variances for prohibited uses.**
 - A flood hazard prevention ordinance adopted by a county or city pursuant to this Part shall, at a minimum: (1) Meet the requirements for participation in the National Flood Insurance Program...

What is Permitted by Law?

- **§ 143-355. Powers and duties of the Department (*DEQ*):**
 - (15) Initiate, plan, study, and execute a long-range floodplain management program for the promotion of health, safety, and welfare of the public. In carrying out the purposes of this subsection, the primary responsibility of floodplain management rests with the local levels of government and it is, therefore, the policy of this State and of this Department to provide guidance, coordination, and other means of assistance, along with the other agencies of this State and with the local levels of government, to effectuate adequate floodplain management programs.
- **§ 160D-923. Floodplain regulations.**
 - Any local government may enact and enforce floodplain regulation or flood damage prevention regulations as authorized by Part 6 of Article 21 of Chapter 143 of the General Statutes and shall comply with all applicable provisions of that Part and, to the extent not inconsistent with that Article, with this Chapter.

What is Permitted by Law?



What is Permitted by Law?



Recommendations:

- **Include “Guiding” Language in EO266:** All State agencies responsible for the administration of grant or loan programs involving the construction of building, structures, or other facilities shall evaluate flood hazards in connection with such facilities and, in order to minimize the exposure of facilities to potential flood damage and the need for future State expenditures for flood protection and flood disaster relief, shall preclude the unsafe or unnecessary use of floodplains in such connection.
- **Publish an “analysis” per EO266:** Legal, regulatory, financial, and environmental implications. Propose possible law changes.

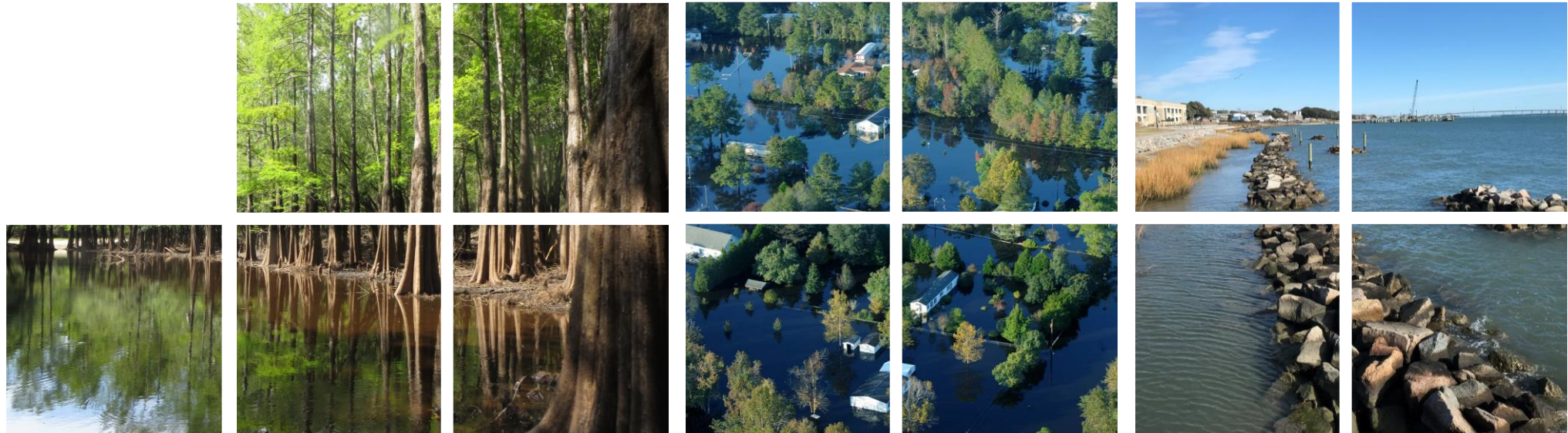
Questions?



Nature-Based Infrastructure

Goal – Incorporate nature-based infrastructure to reduce flood risk.

Topics – How and what to include, triggers, affect on project cost.



What Is Nature-Based Infrastructure?

Sustainable planning, design, environmental management, and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience.

– Federal Emergency Management Agency

Nature-based solutions designed to reduce flood risk

- land conservation and preservation of existing trees and other natural landscape features
- wetland and floodplain restoration and protection
- living shorelines, including oyster reefs and dunes
- green roofs
- rainwater harvesting with cisterns
- suspended and other permeable pavement for plazas, parking areas, and sidewalks
- disconnected impervious surfaces
- rain gardens, bioretention areas, and vegetated swales
- tree canopies and trenches

Standards for Nature-Based Infrastructure in State Construction?

Executive Order 123

- No standards or requirements for nature-based infrastructure

Executive Order 266

- Support natural hydrologic conditions and the beneficial services provided by natural infrastructure
- Provide standards, options, and considerations for including nature-based infrastructure to reduce flood risk

Stakeholder Engagement – Public Meeting, May 10, 2023 Marbles Kids Museum, Raleigh

Application of Nature-Based Solutions under Executive Order 266 to Update the State's Uniform Floodplain Management Policy

- Organized by the North Carolina Coastal Federation, the North Carolina Department of Administration, North Carolina Office of Recovery and Resiliency, and The Pew Charitable Trusts
- Held as a joint meeting with the Stream Management and Flooding Reduction Interagency Working Group
- 50 attendees from state agencies, local governments, environmental nonprofits, industry experts and other stakeholders
- Presentations included:
 - *State and Federal Approaches for Using Nature-based Strategies to Reduce Flood Impacts* - Lauren Kolodij, North Carolina Coastal Federation and Kristiane Huber, The Pew Charitable Trusts
 - *Incorporating Low Impact Development and Nature-based Solutions in an updated Uniform Floodplain Management Policy* - Annette Lucas, PE, McAdams Co.

Ad Hoc Subcommittee on Nature-Based Infrastructure

State Agencies and Organizations Represented

- North Carolina Department of Administration
- North Carolina Department of Environmental Quality
- North Carolina Department of Transportation
- North Carolina Emergency Management
- North Carolina Office of Recovery and Resiliency
- University of North Carolina – Chapel Hill
- Environmental Defense Fund
- North Carolina Coastal Federation
- Pew Charitable Trusts
- The Nature Conservancy
- McAdams Co.
- Tetra Tech

Meetings Held

- June 6, 2023
- June 23, 2023
- July 12, 2023



Brunswick Town-Fort Anderson Historic Site
Wave Attenuators, photo by Atlantic Reefmakers

Summary of Recommendations

Definitions

- *Nature-based infrastructure* (also referred to as nature-based solutions) follows the FEMA definition
- *Maximum extent technically feasible (METF)* means meeting the design standards and requirements of the policy to the greatest extent achievable given site-specific technical constraints. Cost alone does not justify a finding that the METF was not achievable.

Establishes the benefits of using nature-based infrastructure

- reduce flood risk, protect coastal property, restore and protect wetlands, and stabilize shorelines
- Improve water quality, reduce urban heat, recreational opportunities, resilience to climate change

Summary of Recommendations *continued*

Applicability

- Buildings, parking lots, sidewalks, and driveways
- New construction, expansion, and renovation (as defined for entire policy)
- Does not apply to interior renovations or existing pavement areas as long as no new land disturbance

Requirements

- Incorporate nature-based infrastructure to reduce flood risk to and created by the proposed construction to the *maximum extent technically feasible*
- Include nature-based infrastructure early in funding (OC-25), planning, and design
- Avoid siting in areas of high flood risk
- Avoid fill and construction on fill in areas of high flood risk

Summary of Recommendations *continued*

Requirements *continued*

- Stormwater control measures
 - Comply with the volume matching requirements of the NC Department of Environmental Quality's Stormwater Design Manual *except*
 - NC Department of Transportation projects shall comply with NCDOT's individual National Pollution Discharge Elimination System and shall incorporate nature-based solutions for stormwater management to the greatest extent feasible
- Use living shorelines and other nature-based infrastructure to stabilize banks near waterways

Waiver

- If a state agency cannot comply with the siting and design requirements, it shall comply to the METF and seek a waiver from the Department of Administration



Natural infrastructure for stormwater control - permeable paving

Summary of Recommendations *continued*

Additional Recommendations

- Include language in the policy that if any of the requirements of the policy conflict with other legal requirements, the proposed construction shall comply with the requirements set forth in this policy to the greatest extent allowed by law
- All state construction projects—regardless of whether they are located within areas at flood risk—should be required to incorporate nature-based solutions to improve the state’s resilience to flooding.



Natural infrastructure for stormwater control – disconnected impervious surfaces and bioretention/rain garden

Questions?



Final Questions / Comments?

Raffaele Esposito, PE

EO123 Deficiencies

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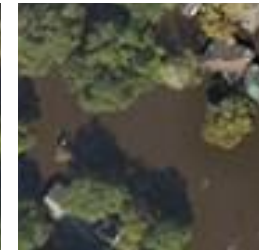
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**Materials and draft for
comment will be
available at**

**[https://ncadmin.nc.gov/
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NC★DOA
Department of Administration
State Construction Office

Thank You!

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